This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1-24. (cancelled)

25. (previously amended) A composition comprising a monospecific $F(ab')_2$ wherein the $F(ab')_2$:

(a) is free of $F(ab')_2$ having hinge region intrachain disulfide bonds; and

(b) comprises a first and a second Fab', each first and second Fab' comprising a CH1 domain fused to an amino acid sequence of up to 10 amino acids, wherein the amino acid sequence of about up to 10 amino acids comprises a C terminal amino acid sequence of Cys-Ala-Ala, and the cysteine of the first Fab' forms a bond with the cysteine of the second Fab' to form the monospecific $F(ab')_2$.

26-38. (cancelled)

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39. (previously presented) The composition of claim 25, wherein the $F(ab')_2$ polypeptide lacks a heavy and light interchain disulfide bond.

40. (previously presented) A composition comprising a $F(ab')_2$ comprising a first and second Fab', wherein each first and second Fab' comprises a CH1 region fused to an amino acid sequence consisting of Cys-X-X, wherein one or both Xs are absent or X is Ala, Arg, Asp or Pro.

41. (previously amended) The composition of claim 40, wherein the amino acid sequence consists of Cys-Ala-Ala or Cys-Pro-Pro.

42. (previously presented) The composition of claim 40, wherein the $F(ab')_2$ lacks a heavy and light interchain disulfide bond.

43. (previously presented) The composition of claim 25, wherein the $(Fab')_2$ lacks glycosylation.

44. (previously amended) A composition comprising a monospecific $F(ab')_2$ produced by the process of:

a) expressing a nucleic acid sequence encoding a Fab' in a microbial host cell under conditions suitable for secretion of the Fab' to the periplasmic space; wherein the Fab' comprises a CH1 domain fused at its C terminus to an amino acid sequence of up to 10 amino acids, wherein the amino acid sequence of up to 10 amino acids comprises a C terminal amino acid sequence of Cys-Ala-Ala;

b) recovering the Fab' from the host cell and coupling the free thiol of each Fab' to form ~~a~~ the monospecific $F(ab')_2$.

45-48. (cancelled)

49. (previously presented) A composition comprising a Fab' coupled to a heterologous molecule produced by the process of:

a) expressing a nucleic acid sequence encoding a Fab' in a microbial host cell under conditions suitable for secretion of the Fab' to the periplasmic space; wherein the Fab' comprises a CH1 domain fused at its C terminus to an amino acid sequence of up to 10 amino acids, wherein the amino acid sequence comprises a C terminal amino acid sequence of Cys-Ala-Ala;

b) recovering the Fab' from the host cell and coupling the free thiol of the Fab' with the heterologous molecule.

50. (previously presented) The composition of claim 49, wherein the heterologous molecule is a detectable label, or solid support.

51. (previously presented) The composition of claim 50, wherein the detectable label is a radionuclide or fluorescent probe.

52. (previously presented) The composition of claim 49, wherein the CH1 domain of the Fab' is fused at its C terminus to Cys-Ala-Ala.

53. (new) The composition of claim 49, wherein the Fab' lacks glycosylation.

54. (new) A composition comprising an antibody fragment coupled to a heterologous molecule produced by the process of:

a) expressing a nucleic acid sequence encoding the antibody fragment in a microbial host cell under conditions suitable for secretion of the antibody fragment to the periplasmic space; wherein the antibody fragment is a Fab' in which a heavy chain CH1 domain is fused to one or more cysteines or a short cysteine-containing polypeptide of about 1-10 residues, and wherein the Fab' comprises a C terminal amino acid sequence of Cys-Ala-Ala; and

b) recovering the Fab' antibody fragment from the host cell and coupling the free thiol of the Fab' with the heterologous molecule.

55. (new) The composition of claim 54, wherein the heterologous molecule is a detectable label, or solid support.

56. (new) The composition of claim 55, wherein the detectable label is a radionuclide or fluorescent probe.

57. (new) The composition of claim 54, wherein the short cysteine containing polypeptide comprises a part of a hinge region.

58. (new) The composition of claim 57, wherein the hinge region has all of the hinge region cysteines C terminal to the first cysteine deleted or substituted.

59. (new) The composition of claim 54, wherein the Fab' lacks glycosylation.

60. (new) A composition comprising a monospecific $F(ab')_2$ produced by the process of:

a) expressing a nucleic acid sequence encoding a Fab' in a microbial host cell under conditions suitable for secretion of the Fab' to the periplasmic space; wherein the antibody fragment is a Fab' in which a heavy chain CH1 domain is fused to one or more cysteines or a short cysteine-containing polypeptide of about 1-10 residues, and wherein the Fab' comprises a C terminal amino acid sequence of Cys-Ala-Ala;

b) recovering the Fab' from the host cell and coupling the free thiol of each Fab' to form ~~a~~ the monospecific $F(ab')_2$.

61. (new) The composition of claim 60, wherein the heterologous molecule is a detectable label, or solid support.

62. (new) The composition of claim 61, wherein the detectable label is a radionuclide or fluorescent probe.

63. (new) The composition of claim 60, wherein the short cysteine containing polypeptide comprises a part of a hinge region.

64. (new) The composition of claim 63, wherein the hinge region has all of the hinge region cysteines C terminal to the first cysteine deleted or substituted.

65. (new) The composition of claim 60, wherein the Fab' lacks glycosylation.